(19) World Intellectual Property Organization

International Bureau



(43) International Publication Date 21 April 2005 (21.04.2005)

(10) International Publication Number WO 2005/034662 A1

(51) International Patent Classification7:

A41D 13/005

(21) International Application Number:

PCT/PT2004/000024

(22) International Filing Date: 13 October 2004 (13.10.2004)

(25) Filing Language:

(26) Publication Language:

English

(30) Priority Data: PT 103030

17 October 2003 (17.10.2003) PT

(71) Applicants and

(72) Inventors: NUNES RAMOS DE CARVALHO, Bruno Manuel [PT/PT]; Rua Abel Manta N°1,3°Esq., P-2780-174 Oeiras (PT). DOS SANTOS SIMÕES, Fernando António [PT/PT]; R. Vale del Milho, N°58, P-2725-150 Algueirão (PT). PATRÍCIO DIAS, Ricardo Paulo [PT/PT]; Urb. D. João Lote 3-9°Esq.AT, P-3030-030

(74) Agent: PEREIRA DA CRUZ, João Manuel May, Rua

Vitor Cordon, 14, 1249-103 Lisboa (PT).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM,

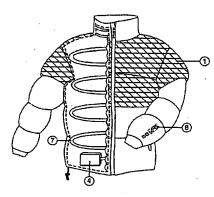
(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

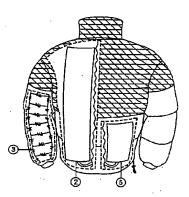
Published:

with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: AUTONOMOUS GARMENT WITH ACTIVE THERMAL CONTROL AND POWERED BY SOLAR CELLS





(57) Abstract: The invention refers to an autonomous system and to a method that allows the active thermal control of garments using solar cells as the power source. In the simplest configuration, the system includes a piece of clothing with solar cells (1), a thermal module able to generate heat and cold (3, 4, and 5), and a unit for controlling and monitoring the internal environment (6). In order to increase versatility and to optimize operation conditions, the system includes batteries (2) that can be charged by the solar cells or externally, increasing energy autonomy and improving performance in low radiation conditions. Proper distribution of electric resistors (3) and refrigeration pipes (7) allow a fine-tuning regulation of temperature inside the garment. The garment is developed not only for standard conditions but also for extreme heast and cold environments, being optimised wither for standard solar radiation or other relevant spectral source.